No.99MAM016B2
SERIES No.264

IT-007R

Input Tool

User's Manual

Read this User's Manual thoroughly
before operating the instrument. After reading,
retain it close at hand for future reference.

Mitutoyo

Conventions for Describing Software Operation

Microsoft, MS-DOS, Windows, Windows Vista and Excel are registered trademarks and/or trademarks of Microsoft Corporation in the United States and/or other countries.

CONVENTIONS USED IN USER'S MANUAL

Safety Precautions

To operate the instrument correctly and safely, Mitutoyo manuals use various safety signs (Signal Words and Safety Alert Symbols) to identify and warn against hazards and potential accidents.

● The following signs indicate general warnings:

DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in serious injury or death.
WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in serious injury or death.
CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or property damage.

● The following signs indicate specific warnings or prohibited actions, or indicate a mandatory action;

	Alerts the user to a specific hazardous situation. The given example means ″Caution, risk of electric shock″
	Prohibits a specific actions. The given example means ″Do not disassemble″
	Specifies a required action. The given example means ″Ground″.

CONVENTIONS USED IN USER'S MANUAL

On Various Types of Notes

The following types of notes are provided to help the operator obtain reliable measurement data through correct instrument operation.

IMPORTANT

- An important note is a type of note that provides information essential to the completion of a task. You cannot disregard this note to complete the task.
- An important note is a type of precaution, which if neglected could result in a loss of data, decreased accuracy of instrument malfunction/failure.

NOTE A note emphasizes or supplements important points of the main text .A note supplies Information that may only apply in special cases(e.g.. Memory limitations, equipment configurations, or details that apply to specific versions of a program).

TIP A tip is a type of note that helps the user apply the techniques and procedures described in the text to their specific needs.

It also provides reference information associated with the topic being discussed.

Mitutoyo assumes no liability to any party for any loss or damage,direct or indirect, caused by use of this instrument not conformaing to this manual.

Information in this document is subject to change without notice.

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Safety Precautions

- This user's manual provides important information on safe use of the Input Tool (IT-007R). Read the user's manual thoroughly before using this instrument.
  Especially, read carefully the "Precautions for Use" given at the beginning of this manual to fully understand them for better use of the instrument.
  Store this manual in a safe place for future reference as necessary while the instrument is in service.
  Mitutoyo has paid due attention to ensure the safe use of this instrument without any harm to the properties of the customers.
- Operate the instrument according to this manual.

Precautions for Use

IMPORTANT To ensure safe operates with this instrument, check the following items prior to use.

The Input Tool operates with the power supplied form the PC connected. Depending on the manufacturers or models, PCs may generate significant interference noise. Be sure to check that the entire system operates normally before starting measurement. Check the system according to the following procedure.

1)Connect the Input tool to measuring tool and the PC (or equivalent),then turn the PC on.(It needs not to open the data input window.)

2)Zero set the measuring tool.(Refer to the respective User's Manual)

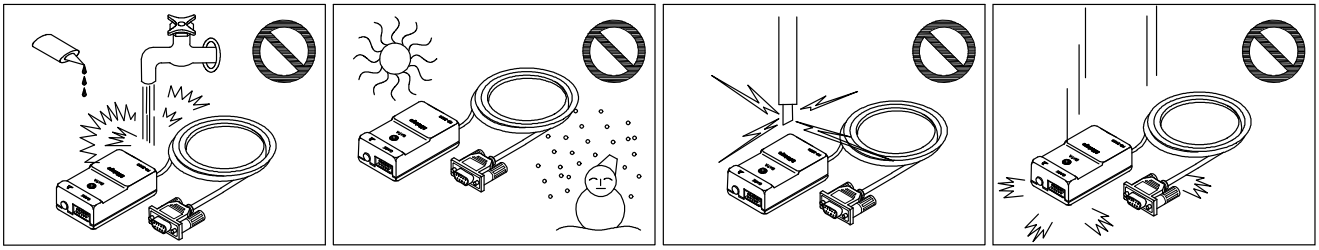
3)Open the measuring faces(contact point)to the point of workpiece insertion, then close them to the original zero point. Check to be sure that the measuring tool displays zero.

4)Repeat step 3 for 5 times. If the measuring tool repeats zero for each time, you may safely use the system for measurement.

5)In the event that the instrument malfunction should result, please contact Mitutoyo office.

CAUTION

- As this product is an electronic instrument, it may be damaged if it is dropped. Be careful to handle this product.
- Do not leave the Input Tool at site where it may be subjected to direct sunlight, in the car or near the heat.
- Do not use the Input Tool at site where it may be subjected to water or oil.
- Do not disassemble the Input Tool.
- If a malfunction is not solved with switches, remove the cables and connect them again.
- Wait more than one second before outputting the data with the "Input Tool for RS232C" after the completion of previous data output to avoid outputting an error data.



WARRANTY

This product has been manufactured under the rigorous quality control. Should it malfunction under normal use within one year from the date of original purchase, it will be repaired or replaced, at our option, free of charge. Contact your dealer or the nearest Mitutoyo representative for more information.

However, the following damages may be subject to a repair charge even if damage occurs within the warranty period:

1. Unit malfunction or damage arising from improper handling, or unauthorized retrofit or repair by the user.

2. Unit malfunction or damage as the result of moving, dropping, or transporting after purchase.

3. Unit malfunction or damage due to fire, salt, gas, abnormal voltage, or natural ca-tastrophe.

This warranty is not transferable and is only valid within the country of the original purchase.

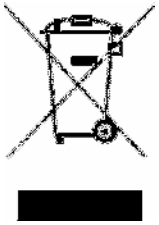
CONVENTIONS USED IN THIS MANUAL

Safety Precautions

To ensure that instruments are operated correctly and safely, Mitutoyo manuals use various safety symbols (Signal Words and Safety Alert Symbols) to identify and warn against hazards and potential accidents.

The following signs indicate **general** warnings:

Disposal of Old Electrical & Electronic Equipment (Applicable in the European Union and other European countries with separate collection systems)



This symbol on the product or on its packaging indicates that this product shall not be treated as household waste. To reduce the environmental impact of WEEE (Waste Electrical and Electronic Equipment) and minimize the volume of WEEE entering landfills, please reuse and recycle.
For further information, please contact your local dealer or distributors.

Conventions Concerning Korea Certification / 한국 규제 (KC)에 관한 표기

Notes for users / 사용자안내문

Models	Notes for users
Class A equipment (Materials for professional broadcasting and communications equipment)	Retailers and users should note that this equipment is professional-use only (class A) electron wave compliant equipment and not for household use.

기 종 별	사 용 자 안 내 문
A 급 기기 (업무용 방송통신기자재)	이 기기는 업무용(A 급)전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

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MEMO

1 INTRODUCTION

This chapter explains the Input Tool practical operating procedure

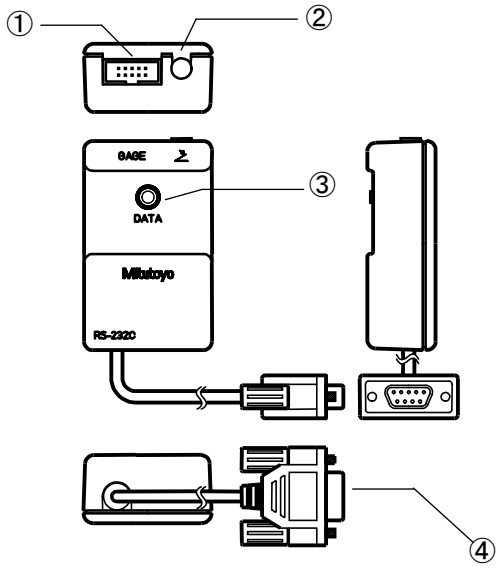
1.1 Input Tool for RS-232C

- Measuring instrument data can be inputted via the personal computer RS-232C connector.
- Automatic measurement and control can be performed because the personal computer can issue a data request.

1.1.1 Applicable models

PC/AT, PC/AT-compatible, and compatible machines (including notebook type) with an RS-232C interface.

1.1.2 Name and function of each part



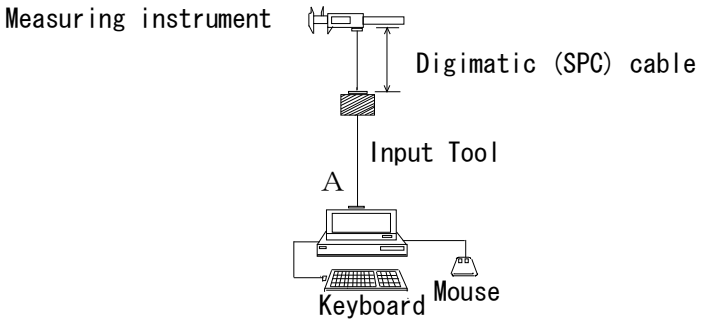
① Digimatic (SPC) 10-pin connector
: Connection with the Mitutoyo Digimatic (SPC) cable.
Refer to section 2.2 Table 1 List of Digimatic (SPC) cables.

② Foot switch jack
: For connection with the foot switch No.937179T (optional).

③ DATA button
: Press to acquire data.

④ D-sub 9-pin female connector
: connect to the RS-232C connector of the personal computer.

1.1.3 System connection method



CAUTION Depending on the personal computer used, a commercial conversion connector/cable may be required at (A) .

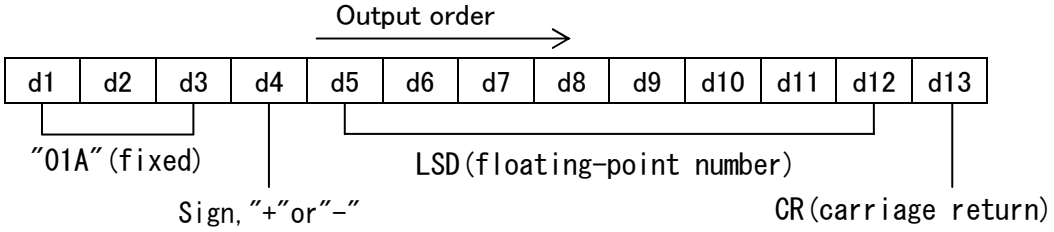
Use straight-type conversion cable.

1.1.4 Data acquisition method

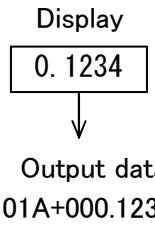
・ Press the DATA button on the measuring instrument, Digimatic (SPC) cable, or Input Tool main unit so the personal computer can read the data. The data can also be acquired if the data request signal (a single, optional character) is sent from the personal computer.

＊ Data format

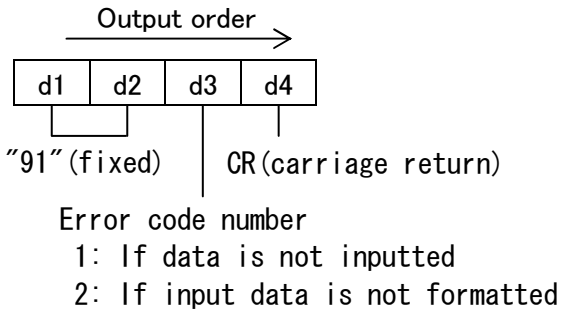
1, Data output



2, Data format example



3, If an error code is outputted



CAUTION d1~d13 are respectively represent one byte.

* Connector specifications

PinNo.	Symbol	Signal line name*1	Direction*2	Power*3
1	(N.C.)	(No connect)	(None)	
2	RXD	Received Data	Output	
3	TXD	Transmitted Data	Input	
4	DTR	Data Terminal Ready	Input	Input
5	GND	Ground	-	Ground
6	DSR	Data Set Ready	Output	
7	RTS	Request To Send	Input	Input
8	CTS	Clear To Send	Output	
9	(N.C.)	(No connect)	(None)	

CAUTION

*1: The signal line name is from the perspective connected to a PC.

*2: The direction of the input and output is viewed from the Input Tool.

*3: This signal line is used as a power supply of the Input Tool.
THESE SIGNAL LINES MUST BE CONNECTED.

* Communication specifications

```
Output signal level  : Conforms to RS-232C standard
Communication method : Full-duplex
Baud rate            :  2400 bps
Bit configuration    : start bit   1 bit
                       data bits   8 bits
                       parity bit  none
                       stop bit    1 bit
X parameter          : Disables control
S parameter          : Disables input/output
Home position        : DCE (modem specification)
```

IMPORTANT

・To ensure stable data input, assign a data input interval of approximately one second. A shorter interval may result in a data error. If an error results, an appropriate error handling procedure must be executed in a program.

・A few seconds of power accumulation time is required before starting data input.

* Sample program (press any key to acquire data, press "0" to terminate) with NEC's N88BASIC (MS-DOS version).

```
100 '<SAMPLE PROGRAM>  ' baud rate is fixed at 2400 bps.
110 OPEN "COM1:N81NN" AS #1        ' opening the RS-232C communication line
120 INPUT WAIT 30," 0 = END ";B$   ' 3-second power accumulation,
                                     display of operation method
130 A$=INKEY$                      ' wait for key input
140 WHILE A$<>"0"                  ' "0" for termination
150   A$=""
160   WHILE A$=""
170     A$=INKEY$
180     IF LOC(1)>0 THEN A$="1"
190   WEND
200   CNT=CNT+1                      ' count up starts if any key is
pressed.
210   PRINT #1,"1"                   ' sends a DATA request signal.
220   INPUT #1,B$                    ' receives DATA.
230   WHILE  LEFT$(B$,3)<>"01A"      ' error handling
240     B$=MID$(B$,2)                ' if the DATA button is pressed.
250   WEND
260   PRINT CNT,B$,VAL(MID$(B$,4,9)) ' screen display
270 WEND
280 CLOSE #1
290 END                               ' end of program
```

1.1.5 PC software for importing data

IMPORTANT ・One of the following ways can be chosen:

1.Creating software by yourself.

2.Purchasing MITUTOYO software which can import the data stated in item 1.2.5.

3.Choosing software on the market.

* For information about the applicable software for RS-232C communication, contact the following.

Orange house Co.,Ltd.

Phone: 81-820-74-3887

Facsimile: 81-820-74-2187

http://www.orangehousejapan.com/

2 Specifications

This chapter describes the specifications of each part of the Input Tool.

2.1 Specifications

Power supply	: Supplied from the personal computer via the RS-232C connector to accumulate power for control signals.
Data transfer speed	: Fixed at 2400 bps
Response speed	: 1 session/second
Compatible OS	: MS-DOS, Windows 3.1, Windows 95, Windows 98, Windows 98SE, Windows 2000, Windows Me, Windows XP, Windows Vista, Windows 7, Pocket PC 2002, Windows Mobile 2003, Windows Mobile 2003SE, Windows Mobile 5.0, Windows Mobile 6.0, Windows Mobile 6.1, Windows Mobile 6.5
Connector standard	: D-sub 9-pin female (cable)
External dimensions	: W44.0mm × D77.0mm × H23.5mm (Main unit)
Cable length	: 0.9m
Mass	: 74g
Operation temperature	: 0℃ ～ 40℃
Storage temperature	: -10℃ ～ 60℃
Applicable standards	: CONFORMANCE TO EC DIRECTIVES This system conforms to the following EC Directive: 2004 / 108 / EC Standard: EN61326-1:2006 Immunity test requirement: Clause 6.2 Table 2 Emission limit : Class B

2.2 Table 1 List of Digimatic (SPC) cables

Connector type	Cable length: Part No.	Applicable Digimatic measuring instrument (with output)	
		Series No.	Product name.
1) Flat, Straight	1m:905338 2m:905409	192	·Digimatic Height Gage HDM-A, HDM-AX, HD-AX
		500	·Digimatic Caliper
		543	·Digimatic Indicator IDS
2) Flat, L type (back)	1m:905689 2m:905690	543	·ABS Digimatic Indicator ID-C (only (1) can be used)
		547	·Digimatic Depth Gage
		550	·Digimatic Caliper
3) Flat, L type (right)	1m:905691 2m:905692	551	·Digimatic Caliper
		552	·Digimatic Carbon Fiber Caliper
		570	·Digimatic Height Gage HDS
4) Flat, L type (left)	1m:905693 2m:905694	572	·Digimatic Length Measuring Unit
		574	·Heightmatic Height Gage HDF-N
		575	·Digimatic Indicator ID-U
		811	·Hardmatic HH-300
5) With the data load switch	1m:959149 2m:959150	500	·ABS Digimatic Caliper CD-C/CX
		571	·ABS Digimatic Depth Gage VDS-DCX
		572	·ABS Digimatic Length Measuring Unit SD (including ABS-type dedicated calipers)
		573	·ABS Digimatic Caliper CD-SC
6) With the data load switch, Waterproof type	1m: 05CZA624 2m: 05CZA625	500	·ABS Coolant Proof Caliper CD-PM/GM
		500	·Super Caliper CD-S_PM
		500	·ABS Coolant Proof Caliper CD-PMX
		550	·ABS Coolant Proof Caliper CDC-P_PMX
		551	·ABS Coolant Proof Caliper CDN-P_PMX
		552	·ABS Coolant Proof Carbon Fiber Caliper CFC-G/GL/GC/GU
		571	·ABS Coolant Proof Depth Gage VDS-PMX
		572	·ABS Coolant Proof Digimatic Scale Unit SD-G
		573	·ABS Coolant Proof Exclusive Caliper NTD-PMX
7) With the data load switch, Waterproof type	1m: 05CZA662 2m: 05CZA663	293	·QuantuMike MDE-MJ
		293	·Coolant Proof Micrometer MDC-MJ/MJT
		293	·Coolant Proof Exclusive Micrometer (The end of the mark is –MJ/MJB)
		314	·Digimatic Exclusive Micrometer VM-M
		329	·Digimatic Exclusive Micrometer DMC-M
		343	·Digimatic Exclusive Micrometer OMP-M
		345	·Digimatic Exclusive Micrometer IMP-M
		350	·Coolant Proof Digimatic Micrometer Head MHN-MJ/MJN
		369	·Digimatic Exclusive Micrometer PDM-M
		406	·Digimatic Exclusive Micrometer OMV-M
		422	·Digimatic Exclusive Micrometer BLM-M
		468	·Digimatic Holtest HTD

Connector type	Cable length: Part No.	Applicable Digimatic measuring instrument (with output)	
		Series No.	Product name.
8) Round type (6-pin)	1m:937387 2m:965013	121	·Digimatic Bench Micrometer BD
		164	·Digimatic Micrometer Head MHD-M/CM
		227	·Adjustable Measuring force Digimatic Micrometer CLM
		227	·Digimatic Disk Micrometer CLM-DK
		227	·Digimatic Micrometer Head CLM-MH
		293	·Quickmike
		293	·Digimatic Micrometer MDC
		329	·Digimatic Depth Micrometer DMC-DM
		337	·Digimatic Inside Micrometer Extension Rod Type IMZ-M
		339	·Digimatic Inside Micrometer Extension Pipe Type IMJ-M
		345	·Digimatic Inside Micrometer Caliper Type IMP-DM
		350	·Digimatic Micrometer Head MHN-DM/M/CM (including ABS-type dedicated calipers)
		468	·Digimatic Micrometer Holtest HTD
		515	·Digimatic Height Master HME
		568	·Boremetic SBM-C
		810	·Hardness Testers HM-100/200, HV-100, HR-500, HH-411
9) Plain type (10-pin)	1m:936937 2m:965014	174	·KC Counter (with Digimatic code output)
		178	·Surftest SJ-201/301/401, SV-400
		179	·Digiderm DGE
		211	·Roundtest RA-112/122
		211	·Roundtest RA-300/400 (with dedicated electronic analysis unit)
		302	·Precision Profile Projector PJ-3000
		303	·Precision Profile Projector PJ-500
		318	·Litematic VL
		515	·Digital Cera-Height Master HMD
		518	·Linear Height QMH-S
		519	·Digital Mu-Checker
		542	·Linear Gage Counter EB, EC-D, EF
		543	·Digimatic Indicator ID-F/H
		544	·Laser Scan Micrometer LSM
10) Flat, Straight Waterproof type	1m: 21EAA194 2m: 21EAA190	543	·ABS Digimatic Indicator ID-N, ID-B

* The appearance, specification, and price of the Digimatic (SPC) cables may be subject to change for improvement without notice.

MEMO

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